



# ***Cd and Cr+6 Uses on Stryker Family of Vehicles***

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STRYKER BRIGADE COMBAT TEAM

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# Stryker Family of Vehicles

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SBCT	Quantity
Infantry Carrier Vehicle	108
Mortar Carrier	36
Reconnaissance	48
Engineer Squad	9
Fire Support	13
Commander's	39
Medical	17
Antitank Guided Missile (ATGM)	9
NBCRV	3
Mobile Gun Systems (MGS)	27
Total	309

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# ***Environmental Management***

- PMO Stryker BCT formally handles ESOH issues as part of its Environmental Hazard Management Program (EHMP) and Stryker System Safety Working Group.
- The Stryker EHMP assists PMO Stryker BCT in managing potential and known environmental hazards associated with the Stryker FoV
  - Identifying hazards
  - documenting and tracking hazards
  - reducing if not eliminating hazards
- The EHMP is based upon MIL-STD-882.



# ***Environmental Management (Cont'd)***

- In order to encompass expertise outside of PMO SBCT, PM SBCT established the Stryker Environmental Management Team (Stryker EMT) to assist with the EHMP.
- PM SBCT EMT consists of representatives from:
  - PMO SBCT Divisions
  - Prime contractor
  - ASA(ALT) Environmental Support Office
  - Army Environmental Center
  - Army Research Laboratory
  - Fielding/Test Installations
  - Other DA Organizations
- This collection of expertise enables PMO SBCT to concurrently incorporate perspectives and input regarding:
  - Pollution prevention opportunities
  - Resolve known and previously unknown environmental issues associated with the Stryker FoV manufacture, operation, maintenance, and demilitarization/disposal





# ***Contractual Requirements***

- The Stryker production and logistics contracts require the Government's approval for use of Cadmium, Hexavalent chromium, highly toxic or carcinogenic materials.
- PMO SBCT requires the prime contractor to obtain a waiver in order to use Hexavalent chromium, Cadmium, and Beryllium
- The waiver specifies why the hazardous material is required, where it will be used, and efforts underway to eliminate the material's use.



## ***Other Cd and Cr+6 Elimination Drivers***

- US and international regulations regarding Cr+6 and Cd have driven the need to identify and implement alternative materials.
  - U.S. OSHA Permissible Exposure Levels for Cd and Cr+6
  - U.S. EPA listing Cr+6 and Cd as RCRA wastes and HAPs
  - EU Directive 2002/95/EC, 27 January 2003: Restrictions on Hazardous Substances (RoHS)



# ***Eliminated Uses of Cr+6 and Cd***

- Uses of Cr+6:
  - DoD-P-15328 wash primer
  - Chromic acid rinse on ferrous parts that are zinc phosphated
  - Chromate conversion coating per MIL-DTL-81706B on non-threaded zinc plated components
  - Chromate conversion coating per MIL-DTL-81706B on non-electrical aluminum parts
- Uses of Cd:
  - Cadmium plated hardware and fasteners





## ***Remaining Uses of Cr+6 and Cd***

- Remaining uses of Cr+6 occurs on:
  - Fasteners (ASTM B633)
  - Surfaces requiring electrical conductivity (MIL-DTL-81706B Class 3)
  - Electrical connectors (MIL-DTL-81706B Class 3)
- Remaining uses of Cd occurs on:
  - Electrical connectors (QQ-P-416)



# ***Barriers***

- Stryker FoV prime contractor reluctant to use alternative materials unless:
  - Alternative materials specified by a military spec./standard or QPL
  - Contractually directed by PMO Stryker BCT
- Alternative materials used by commercial industries are available, but these materials are not validated for military use.



# ***Remaining Needs***

- 1) Replacement for Cr+6 uses on mechanical fasteners and aluminum components that require electrical conductivity**
- 2) Replacement for Cd plating on electrical connectors**
- 3) Metal pretreatment for high hard steel**
- 4) Qualification of existing commercial alternative materials for military applications**



# Questions ?



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